A NEW GENUS AND A NEW SPECIES OF JAPANESE SPIDERS (*FALCILEPTONETA* N. G. AND *SARUTANA KAWASAWAI* N. SP., LEPTONETIDAE)

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The first study on the Leptonetid spider from Japan was made by E. Simon 1893. He described *Leptoneta japonica.* After that, L. Fage and some other taxonomists threw doubt on the classification of this spider. In Japan up to now, Dr. T. Yaginuma, Dr. R. Oi and the author described many new Leptonetid spiders.

Through the author's study, it is now beyond question that the spiders named *Leptoneta* in Japan are different from European genera *Leptoneta* SIMON, 1872; *Paraleptoneta* FAGE, 1913; *Sulcia* KRATOCHVIL, 1938; *Segrea* Roewer, 1953 and *Cataleptoneta* DENIS, 1955.

The present paper is a systematic revision of the spider sub-family Leptonetinae from Japan except *L. akiyoshiensis* OI, 1958, *L. uenoi* Yaginuma, 1963 and *L. tsushimensis* YAGINUMA, 1970.

The author greatly appreciates the help of Mr. Kawasawa and Mr. Nishikawa who kindly presented him with many cave spiders from the Island of Shikoku. Acknowledgment is also extended to Dr. Yaginuma's encouragement for this work.

Falcileptoneta n. g.

Falcileptoneta: *Leptoneta* armed with the falcula on tibia of male palp.

Description: Length 1.7-2.5mm. Cephalothorax longer than broad. Cephalic part narrowing in front. Anterior part is rather convexed. Cephalic suture, radiating grooves and needle shaped median fovea evident. Eyes six in number. In some cases eyes are degenerated. Anterior four eyes arranged in semicircular and posterior two eyes contact with. Sternum rather longer than broad is shield-shaped or of cardioid. Legs armed with spines.

Palp of male: Femur normal in shape. Such spines or spinelike apophyses as those of *Paraleptoneta, Sulcia, Cataleptoneta, Sarutana* absent. Tibia has three trichobothria and the dorsolateral part of the apical end with one or two spinelike apophyses. On rare occasions this structure degenerated into a hair (*F. iriei*). Sometimes, middle part of the retrolateral part with a feathery bristle. Ventral side apophysis missing. Tarsus; transverse depression is weak, has several bristles but no spine. Outer part has a branch, and without such an apical spine as that of the *Leptoneta.* Outer side of the transverse depression, there is no woolly bristle or a long stiff hair which toward the end is flattened, grooved and somewhat twisted, Apical end of the bulb with a sickle-like embolus. Laminae of the bulb are more complex than the *Paraleptoneta.* 8 to 11 teeth on the promargin of the fang furrow arranged in a line. Retromargin with 4 to 11 denticles. Spermatheca of female is short and not coiled.

This genus is rather allied *Paraleptoneta.* It differs from that genus in following characteristics:

Palp of the male:

1) Distal part of the bulb with more than three laminae
2) Tarsus having a branch without spine
3) Apical end of dorsolateral side of the tibia with 1 to 2 spinelike apophyses
4) Ventral part of the tibia without apophysis
5) Femur without apophysis

Spermatheca of the female:

6) Short and not coiled

Type-species: *Falcileptoneta striata* (Oi)

Falcileptoneta striata (**Oi,** 1952)

(Japanese name: Yokofu-mashiragumo)
(figs. 1—9)

Leptoneta striata Oi, 1952, Arachnological News, No. 1, pp. 10–12.

Localities: Ryoji Oi, Senriyama Experimental Farm of Osaka City University, Saidera, Suita City, Osaka Prefecture. Jan. 5 and Feb. 3, 1952, 2 immature females; Nishikawa, Anaiwa-no-ana cave, Sagawa-chō, Kochi Prefecture, Sept. 9, 1965, 1 female; Tetsuo Kawasawa, Anaiwa-no-ana cave, Nov. 27, 1966, 2 males and 1 female; Toshihiro Komatsu, entrance of Anaiwa-no-ana cave, Aug. 5, 1967, 1 male and 3 females.

Male: Total length 1.70 to 1.87mm. Leg formula 1423. Palp, femur>tarsus >tibia>patella. Eyes, 1st>2nd≧3rd. Diameter of the 3rd eye and interval of the 2nd and 3rd eye varied 2:1 to 4:1 in ratio. Palp: Femur is normal shape and without spine or apophysis. Apical end of the patella with a slender spine. Outer margin with a slender branch without such a spine as that of *Leptoneta.* The branch extended downwards. As seen from lateral side, the bulb is longer than broad 2:1 in ratio. Apical end of the bulb with a slim sicklelike embolus which remarkably curved upwards and more than three laminae.

Femora of all legs are normal shape and basal halfs are somewhat swollen. Legs have many trichobothria. Especially, dorsal surface of the distal part of metatarsus I and middle part of other metatarsi with a long trichobothrium respectively. Femora without spines. Tibiae and metatarsi with few spines on their dorsal, lateral and ventral surfaces. Patellae with an apical spine. Metatarsi of all legs, proximal parts with 2 to 4 hairs which arrange transversely. Tarsus and a part of metatarsus have many pseudosegments. Apical end of tarsus with a large onychium and serrated bristles. Upper claw of the 3rd leg without teeth or with several tiny teeth, and a median claw with a tiny tooth. Promargin of the fang furrow with 8 teeth, rather equidistantly and apical one is largest. 4 denticles of retromargin arranged irregularly. Maxillae normal in shape.

In front of the spinnerets there is a pair of tracheal spiracles. The interval is 3.5 times as wide as the diameter of the spiracles.

Sarutana kawasawai n. sp.

(Japanese name: Kawasawa-sarutagumo)

(fig. 13—18)

Loc. and date:- Arakuradō cave, Haruno-chō, Kōchi Prefecture, Nov. 25, 1966, 1 adult male and 1 immature? female.

Collector:- Tetsuo KAWASAWA

Male: Total length 1.8mm. Cephalothorax; length 0.83mm., width 0.70mm. Abdomen; length 0.97mm., width 0.70mm. Leg I 6.54mm. (1.75+0.27+2.07+1.60+0.87). Leg II 4.78mm. (1.33+0.25+1.38+1.07+0.75). Leg III 3.80mm. (1.03+0.21+1.00+0.93+0.63). Leg IV 5.44mm. (1.57+0.27+1.58+1.27+0.75). Palp 1.45mm. (0.63+0.26+0.23+0.33). Eyes: Ratio of major diameter, 1st:2nd:3rd=2.8:3.2:3.0. Ratio of interval, 1st−1st=0.5, 1st−2nd=0.2, 2nd−2nd=4.0, 2nd−3rd=2.0, 3rd−3rd=0.2. Clypeus=8.5. Vertical axes of the 2nd eyes intersect backwards. 3rd eyes run in parallel.

Color (in alcohol): Cephalothorax light brown in ground color with four pairs of uneven chocolate spots. Maxillae, labium and sternum light brown. Chelicerae darker. Legs light brown. Abdomen dull yellow in ground color. Dorsal part with a large chocolate mark and several longitudinal stripes on the both sides. Inner margins of the maxillae white. Hair rather brown and spines black.

Cephalothorax oval in shape but the anterior margin procurved. Two-fifths as high as the length. Needle-shaped median furrow is black. Promargin of the fang furrow armed with 8 teeth. Intervals are narrow. Retromargin armed with 6 denticles. Labium broader than long 4 : 3.5 in ratio, rather semielliptical. Anterior margin with three pairs of black hairs. Labium is about one-third as long as the maxillae. Maxillae longer than broad, anterior parts very broad and middle parts of the both outer margins remarkably outcurved. Inner margins parallel and with seven short hairs. Sternum, about as broad as long is 15 : 16 in ratio. Rather rounded posteriorly. Leg formula 1423. Femora I-IV and tarsi I-IV lacking spines, other segments with some lateral spines. Each tibia I, II, III with a spine on the ventral surface about one-third the distance from the base. Metatarsus I with a ventral spine in the middle part, and II, III, IV with two spines. Ventral parts of the bases of the metatarsi II, III with two fine hairs which are straight.

Onychium is large and indistinguishable from the pseudosegments. Onychium with serrated bristles and three claws. Paired claw with several teeth and median claw with one tooth. Palp is illustrated in fig. 15—17. Dorsal spines and ventral spines of femur diminishing proximally. These spines have not such basal segments or tubercles as those of the *Paraleptoneta* and the *Sulcia*. Patella lacking spines. Tibia with three dorsal trichobothria and the ventral side with five bristles. Apical end of the retrodorsal side with a chitinous apophysis which is tridentate and black in color. Tarsus: distal part of prolateral side with a transverse depression. Apical end with several black bristles. Apical end of the retrolateral side is bifurcated, and this branch with two bristles. Bulb with two prominences, one being embolus and the other being made up of several laminae. Embolus is toothed.

This species can be distinguished from *Sarutana glabra* by the shape of embolus, the absence of a funnel-shaped apophysis and many other characteristics.

On the cave spiders, the size and the arrangment of eyes and arms vary easily in the special life-environment. So the author believes that the type of sexual organs and their accessories is one of the most important characters for the determination of genus in Leptonetinae.

Citinous embolus of *Leptoneta* and *Cataleptoneta* is not evident. *Paraleptoneta, Falcileptoneta* and *Masirana* with the sickle-like embolus. Embolus of *Sulcia* is not curved and *Sarutana* with the special embolus. The species *italica* can be distinguished from *Paraleptoneta* by the absence of the sickle-like embolus and also the absence of the apophysis on the femur. Tarsus with a small branch and its apical end with a long bristle instead of the spine. Therefore, it should be replaced to *Leptoneta*.

The differences of sexual organs and other structures between the genera of Leptonetinae may be table on pagse 6 and 7.

Classification of the species which have been examined is as follows:

Falcileptoneta japonica (SIMON)

Leptoneta japonica SIMON, 1893: Ann. Soc. ent. Fr., 62, Bull., pp, CCXLVII-CCXLVIII.—Fage, 1913: Arch. zool. expér., 5 (10), pp. 565—566.

Falcileptoneta melanocomata (KISHIDA in KOMATSU) (fig. 12)

Leptoneta melanocomata KISHIDA in ISHIKAWA, 1939: Acta arachnol., 4 (4), pp. 162—163.——KOMATSU 1961: Cave Spiders of Japan, pp. 11—12.

Falcileptoneta striata (OI) (fig. 1—9)

Leptoneta striata OI, 1952, Arachnological News (1), pp. 10—12.

Falcileptoneta speciosa (KOMATSU)

Leptoneta speciosa KOMATSU, 1957: Acta arachnol., 14 (2), pp. 68—70.——KOMATSU 1961: Cave Spiders of Japan, pp. 13—15.

Falcileptoneta kugoana (KOMATSU)

Leptoneta kugoana KOMATSU, 1961: Cave Spiders of Japan, pp. 9—11.

Falcileptoneta musculina (KOMATSU)

Leptoneta musculina KOMATSU, 1961: Cave Spiders of Japan, pp. 12—13.

Falcileptoneta usihanana (KOMATSU)

Leptoneta usihanana KOMATSU, 1961: Cave Spiders of Japan, pp. 15—16.

Falcileptoneta zenjoensis (KOMATSU) (fig. 10—11)

Leptoneta zenjoensis KOMATSU, 1965: Acta arachnol., 19 (2), pp. 23—24.

Falcileptoneta iriei (KOMATSU)

Leptoneta iriei KOMATSU, 1967: Acta arachnol., 20 (2), pp. 47—49.

Genus *Masirana* KISHIDA in KOMATSU

Masirana KISHIDA in KOMATSU, 1963: Acta arachnol., 18 (2), p. 26.

Masirana cineracea KISHIDA in KOMATSU[1)]

Masirana cineracea KISHIDA in KOMATSU, 1942: Acta arachnol., 7 (2), pp. 57—60.——KOMATSU 1961: Cave Spiders of Japan, pp. 16—17.

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1) Spelling of *Masirana cinevacea* (Acta arachnologica Vol. 7, No. 2, pp. 57—58) is an erratum.

Comparative Table

Leptoneta	*Paraleptoneta*	*Sulcia*
Maxilla: Anterior edge normal in shape	Same as *Leptoneta*	Same as *Leptoneta*
Palp of male: Apical end of bulb without sicklelike embolus	With a sicklelike embolus and 2 laminae	Not curved
Outside of tarsus with a branch projecting outwards	Without branch	Same as *Paraleptoneta*
Branch with an apical spine[2]	Distal part of outside of tarsus with a short spine	Distal part with a excepted spine, exceptions
Middle part of tarsus with a transverse depression	Depression is weak	Same as *Paraleptoneta*
Outside of depression with a woolly bristle (except *italica*)	Woolly bristle missing	Same as *Paraleptoneta*
Femur is normal in shape	Normal or seldom curved	Curved
Femur without spines or spinelike apophyses	With many spinelike apophyses	Same as *Paraleptoneta*
Apical end of retrodorsal side of tibia without apophyses	In many cases with spines	Without apophyses
Ventral side of tibia without apophyses or spines	In many cases with apophyses or spines	With apophyses
Promargin of fang furrow; 6 to 8 teeth, distal teeth widely separated	(6) 7 to 9 teeth	6 to 8 teeth
Retromargin of fang furrow; 2 to 4 denticles.	2 to 5 denticles	(5) 6 to 7 denticles
Spermatheca of female coiled	Coiled or not coiled	Not coiled

Segrea: (Male is unknown) Both sides of the sternum parallel. Promargin of

[2] *Leptoneta italica* with a long bristle instead of the apical spine.

Cataleptoneta	*Falcileptoneta*	*Masirana*	*Sarutana*
Same as *Leptoneta*	Same as *Leptoneta*	Male; extended outwards Female; rather extended outwards	Male; extended outwards Female; more remarkably extended than *Masirana*
Rather same as *Leptoneta*	With a sicklelike embolus and more than 3 laminae	Same as *Falcileptoneta*	Special embolus
Same as *Paraleptoneta*	Branch projecting downwards	Same as *Falcileptoneta*	Same as *Falcileptoneta*
Same as *Paraleptoneta*	Branch without apical spine	Same as *Falcileptoneta*	Same as *Falcileptoneta*
Same as *Leptoneta*	Same as *Paraleptoneta*	Same as *Paraleptoneta*	Distal part with a depression
Same as *Leptoneta*	Same as *Paraleptoneta*	Same as *Paraleptoneta*	Same as *Paraleptoneta*
Same as *Leptoneta*	Same as *Leptoneta*	Same as *Leptoneta*	Same as *Leptoneta*
Same as *Paraleptoneta*	Same as *Leptoneta*	Same as *Leptoneta*	With many spines
Same as *Sulcia*	With one or two spinelike apophyses	With a curved spinelike apophysis and a funnel-shaped apophysis	With a special apophysis (tridentated apophysis) and sometimes a funnel-shaped apophysis
Same as *Sulcia*	Same as *Leptoneta*	Same as *Leptoneta*	Same as *Leptoneta*
7 teeth	8 to 11 teeth	10 to 11 teeth	8 teeth
4 denticles	4 to 11 denticles	4 to 6 denticles	6 to 7 denticles
	Short and not coiled	Same as *Falcileptoneta*	

the chelicera with 7 teeth. Spermatheca is coiled.

Masirana nippara KOMATSU

Masirana nippara KOMATSU, 1957: Acta arachnol., 14 (2), pp. 71—72.——KOMATSU 1961: Cave Spiders of Japan, pp. 17—18

Masirana akahenei KOMATSU (fig. 22)

Masirana akahanei KOMATSU, 1963: Acta arachnol., 18 (2), pp. 22—24.

Masirana kosodeensis KOMATSU (fig. 21)

Masirana kosodeensis KOMATSU, 1963: Acta arachnol., 18 (2), pp. 24—26.

Genus *Sarutana* KOMATSU

Sarutana KOMATSU, 1957: Acta arachnol., 16 (2), p. 70.——KOMATSU, 1963: Acta arachnol., 18 (2), p. 26.

Sarutana glabra KOMATSU (fig. 19—20)

Sarutana glabra Komatsu, 1957: Acta arachnol., 14 (2), pp. 70—71. ——KOMATSU 1961: Cave Spiders of Japan., pp. 18—19.

Sarutana Kawasawai n. sp. (fig. 13—18)

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Explanation of figures

1–7. *Falcileptoneta striata* (male)
  1. Retrolateral aspect of right palp
  2. Prolateral aspect of right palp
  3. Rather dorsal aspect of left palp
  4. Side veiw
  5. Tibia and metatarsus of lst leg
  6. Left chelicera
  7. Right 2nd leg

8–9. *Falcileptoneta striata* (female)
  8. Spinnerets and tracheal spiracles
  9. Genitalia

10–11. *Falcileptoneta zenjoensis*
  10. Distal part of tarsus (male)
  11. Genitalia (female)

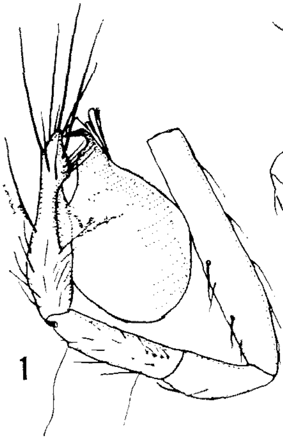
12. *Falcileptoneta melanocomata*: teeth of fang furrow (male)

13–18. *Sarutana kawasawai* (male)
  13. Maxillae, labium and sternum
  14. Ocular area
  15. Prolateral aspect of right palp
  16. Retrolateral aspect of right palp
  17. Dorsal aspect of left palp
  18. Right chelicra

19–20. *Sarutana glabra*
  19. Right chelicera (female)
  20. Maxillae and labium (male)

21. *Masirana kosodeensis*: left chelicera (male)

22. *Masirana akahanei*: left chelicera (male)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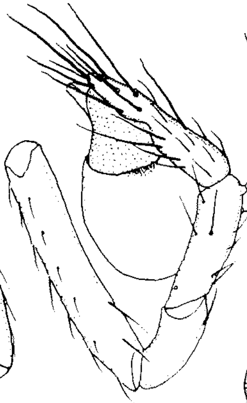
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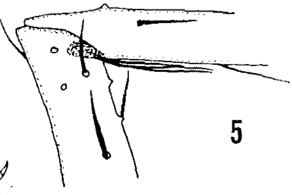
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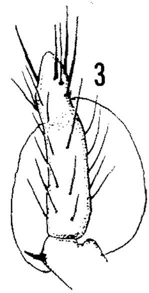
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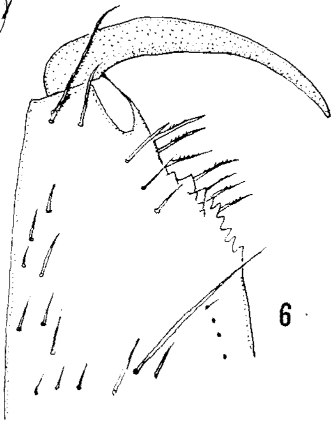
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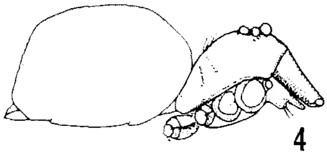
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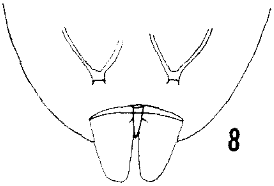
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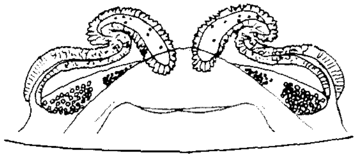
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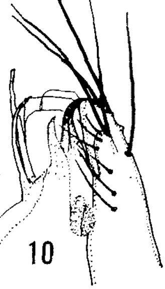
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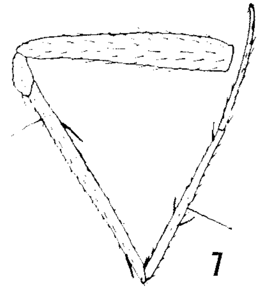
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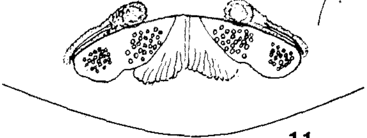
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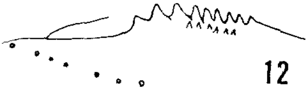
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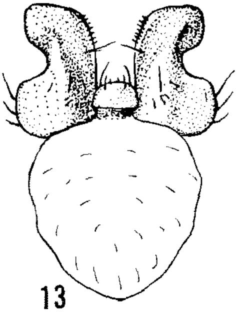

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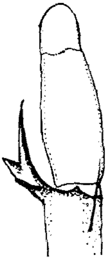

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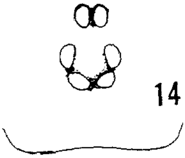

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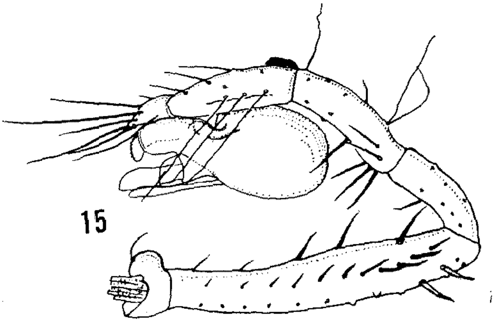

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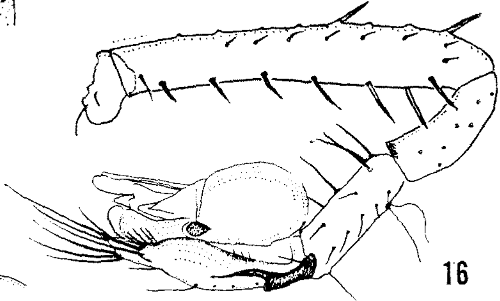

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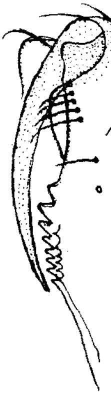

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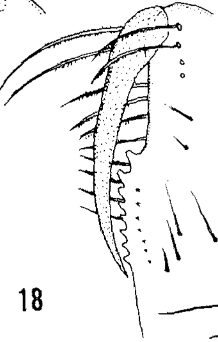

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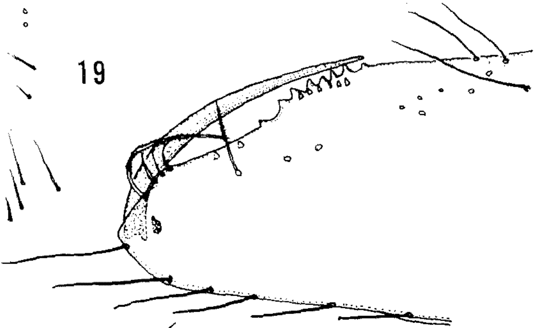

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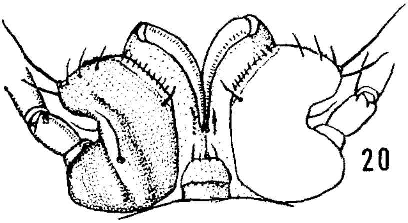

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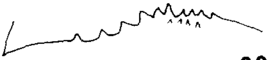

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